E. Charlie Nusbaum

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Research Interest

Macroeconomics, Demographic Change, Labor, Applied Econometrics

Education

University of California, Santa Barbara — Santa Barbara, CA
Ph.D. Candidate, Economics — *Expected June 2021*

University of California, Santa Barbara — Santa Barbara, CA
M.A., Economics — *June 2016*

Richard Stockton College of New Jersey *(Stockton University)* — Galloway, NJ
B.S., Applied Physics — *May 2014*

Publications

Labor Market Dynamics and the Migration Behavior of Married Couples *forthcoming at Review of Economic Dynamics*
with Christine Braun and Peter Rupert

Calibration of a Quasi-Adiabatic Magneto-Thermal Calorimeter Used to Characterize Magnetic Nanoparticle Heating (2013)
Journal of Nanotechnology in Engineering and Medicine, with Anilchandra Attaluri, Michele Wabler, and Robert Ivkov

Working Papers

Aggregate Hours and Local Projections with Long-Run Restrictions

Demographic Obstacles to European Growth
with Thomas Cooley and Espen Henriksen

Works in Progress

Age Dependent Sentencing Reform and Economic Mobility

Teaching Experience

Invited Lectures — University of California, Irvine
Markov Processes with Applications to Search Theory — *Summer 2017*
Introduction to Bayesian Estimation of DSGE Models — *Summer 2017*

Head Teaching Assistant — University of California, Santa Barbara
Intermediate Micro I - ECON 10A — *Summer 2017*

Teaching Assistant — University of California, Santa Barbara
Macroeconomic Theory (Ph.D Level) - ECON 204A-C — *Fall 2017, Winter 2018, Spring 2018*
Intermediate Micro I - ECON 10A — *Fall 2016, Spring 2017, Summer 2017*
Principles of Macro - ECON 2 — *Winter 2017*
Intermediate Micro II - ECON 100B — *Summer 2016*

Teaching Assistant — Richard Stockton College of New Jersey
Physics II Lab — *Fall 2012, Spring 2013*
Physics I Lab — *Fall 2011, Spring 2012*

Academic Presentations

- Society for Economic Dynamics, WUSTL — 2019
- Macroeconomics Brown Bag Seminar, UC Irvine — 2019
- Midwest Macro Fall Meetings, Vanderbilt — 2018
- 3rd Annual All California Macroeconmics Conference, Claremont McKenna — 2018
- 13th Annual Economics Graduate Student Conference, WUSTL — 2018
- Macroeconomics Brown Bag Seminar, UC Irvine — 2018
- Finn Kydland Macroeconomics Workshop, UC Santa Barbara — 2018
- UC Graduate Macroeconomics Workshop, UC Irvine — 2017
- Physics Colloquium, Richard Stockton College — 2014
- NAMS Research Symposium, Richard Stockton College — 2013
- Nan-Bio Symposium, Johns Hopkins University — 2012

Other Academic Contributions

U.S. Economic Snapshot Blog *www.econsnapshot.com*
with Thomas Cooley and Peter Rupert

European Economic Snapshot Blog *www.europeansnapshot.com*
with Thomas Cooley and Peter Rupert

Laboratory for Aggregate Economics & Finance Conference Newsletter Coordinator *www.laef.ucsb.edu*

Recent Professional Experience

Keller Rohrback L.L.P. Seattle, WA
Consulting Expert *March 2019 - Present*

UCSB Economic Forecast Project Santa Barbara, CA
Senior Research Analyst *July 2018 - Present*

Research Assistant University of California, Santa Barbara
Kelsey Jack *August 2019 – October 2019*

Research Assistant University of California, Santa Barbara
Heather Royer *September 2018 – December 2018*

Research Assistant University of California, Santa Barbara
Javier Birchenall *September 2017 – December 2017*

Past Professional Experience

Research Assistant Richard Stockton College of New Jersey
Neil Aaronson *Spring 2015*

The Activity Leaders of New Students (T.A.L.O.N.S.) Richard Stockton College of New Jersey
Student Mentor *Fall 2011 - Fall 2014*

Tutoring Center Richard Stockton College of New Jersey
Math & Physics Tutor *Spring 2014*

Board of Trustees Richard Stockton College of New Jersey
Elected Student Trustee *Spring 2011 - Spring 2013*

Research Assistant Johns Hopkin University
Robert Ivkov *Summer 2012*

Student Senate Public Relations Chair Richard Stockton College of New Jersey
Committee Chair *Spring 2012-Fall 2012*

Student Senate Representative Richard Stockton College of New Jersey
Public Relations Committee Member *Spring 2011-Spring 2012*

International Field Day Planning Committee Richard Stockton College of New Jersey
Committee Member *Spring 2012*

Additional Achievements, & Awards

- Department Block Travel Grant — Fall 2018, Spring 2019
- Graduate Student Association Travel Grant — Fall 2018
- Outstanding Teaching Assistant Award — Spring 2017, Spring 2018
- Gretler Research Fellowship — Summer 2017
- Graduate Student Association Excellence in Teaching Award Nominee — Fall 2016-Spring 2017
- Mercatus Center Adam Smith Fellowship — Fall 2016-Spring 2016
- Regent's Fellowship — Fall 2015-Spring 2016
- Block Grant Fellowship — Fall 2015-Spring 2016
- Provost Scholarship — Fall 2010-Spring 2014
- Kappa Sigma Scholarship-Leadership Award — 2013, 2014
- Who's Who Among Students in American Colleges and Universities — 2012, 2013
- Leadership Education Awareness Development (L.E.A.D.) Certification — 2013
- Harold E. Taylor Physics Award — 2013
- Rising Young Physics Student Award — 2012
- Yitzhak Sharon Physics Book Award — 2011

OTHER

- *Technical Expertise*: Python, MatLab, R, Stata, and HTML (basic)
- *Professional Membership*: Sigma Pi Sigma, Kappa Sigma
- *Citizenship*: U.S. Citizen, Dutch Citizen

REFERENCES

Professor Peter Rupert
Department of Economics
University of California, Santa Barbara
peter.rupert@ucsb.edu

Professor Emeritus Thomas Cooley
Stern School of Business
New York University
tcooley@stern.nyu.edu

Professor Douglas Steigerwald
Department of Economics
University of California, Santa Barbara
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Associate Professor Javier Birchenall
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Seattle, WA
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ABSTRACTS

Labor Market Dynamics and the Migration Behavior of Married Couples with Christine Braun and Peter Rupert

Between 1964 and 2000, the intercounty migration rate of married couples declined by 15%. Concurrently, female labor force participation and the relative wages of women increased. In 1964, 36% of married households had both spouses in the labor force and women earned only 50% of the wages of men. Over the following 36 years, the fraction of dual earner households increased to 75% and women's earnings rose to 64% of men's. Using a two location household level search model of the labor market, we show that both the increase in dual earner households and the rise in women's wages contributed significantly to the decline in the migration rate of married households, with each explaining 53% and 20% of the decline, respectively. In addition, we show that the co-location problem has important implications for estimates of lifetime earnings inequality.

Demographic Obstacles to European Growth with Thomas Cooley and Espen Henriksen

Since the early 1990's there have been persistent slowdowns in the growth rates of the four largest European economies: France, Germany, Italy, and the United Kingdom. This persistence suggests a low-frequency structural change is at work. Aging populations, both in terms of longer individual life expectancies and declining fertility have caused a shift in the age-cohort distribution. Growth accounting identifies the following five sources of economic growth: total factor productivity, capital accumulation, labor supply on the intensive and extensive margin, and population growth. Changing demographics directly affects all these five margins. The effects of aging populations affects economic growth indirectly through the pension systems that are in place and the need to fund them. To fund increasing liabilities with a shrinking tax base, tax rates must increase to balance budgets. This will impose distortions to individual factor-supply choices, providing further headwinds for economic growth. We quantify the additional growth effects resulting from these distortions.

Aggregate Hours and Local Projections with Long-Run Restrictions

I extend the local projections method to identify structural shocks using long-run restrictions. I show that the proposed estimator is substantially more robust than structural VARs (SVARs) to both the choice of lag length and the order of integration of the endogenous variables using data from a standard real business cycle (RBC) model. Benchmark simulations show that the proposed estimator can yield substantial reductions in both the bias and mean squared error of estimated impulse response functions relative to SVARs, particularly at short forecast horizons. In all cases, the proposed estimator correctly estimates the direction of the contemporaneous response and the shape of the full impulse response function, and can eliminate virtually all of the bias for some specification choices. Using my proposed estimator and data obtained from the Bureau of Labor Statistics, I then estimate the response of aggregate labor hours to productivity shocks. In contrast to much of the evidence based on SVARs, I find that labor hours rise in response to positive productivity shocks and subsequently follow a hump-shaped profile. This result is robust to a number of specification choices and provides new evidence in support of the standard RBC model.

Calibration of a Quasi-Adiabatic Magneto-Thermal Calorimeter Used to Characterize Magnetic Nanoparticle Heating

with Anilchandra Attaluri, Michele Wabler, and Robert Ivkov

To assess and validate temperature measurement and data analysis techniques for a quasi-adiabatic calorimeter used to measure amplitude-dependent loss power of magnetic nanoparticles exposed to an alternating magnetic field (AMF) at radiofrequencies (160 ± 5 *kHz). The data collected and methods developed were used to measure the specific loss power (SLP) for two magnetic iron oxide nanoparticles (IONPs) suspensions, developed for magnetic nanoparticle hyperthermia. Calibration was performed by comparing measured against calculated values of specific absorption rate (SAR) of a copper wire subjected to AMF. Rate of temperature rise from induced eddy currents was measured (*$n = 4$*) for a copper wire of radius 0.99mm and length of 3.38mm in an AMF at amplitudes (H) of 16, 20, 24, and 28kA/m. The AMF was generated by applying an alternating current using an 80-kW induction power supply to a capacitance network containing a 13.5-cm vertical solenoid that held the calorimeter. Samples were taped to an optical fiber temperature probe and inserted into a standard (polystyrene, 5ml) test tube which was suspended in the calorimeter. The sample was subjected to the AMF for 30s or until the temperature of the sample, increased by* $30°C$*, recorded at 0.3-s intervals. The SAR of the sample was normalized by H2f1/2, averaged, and compared to theoretical values. Iron (Fe) normalized SLPs of two IONPs (JHU-MION and bionized-nanoferrite (BNF) particles (Micromod Partikeltechnologie, GmbH)) in aqueous suspension were measured in the same setup. We report experimental SAR values for the copper of* 2.4 ± 0.1*,* 4.3 ± 0.2*,* 6.2 ± 0.1*, and* $8.5 \pm 0.1 W/g$ *compared to theoretical values* 3.1 ± 0.1*,* 4.5 ± 0.2*,* 6.5 ± 0.1*, and* $9.2 \pm 0.2 W/g$ *at AMF amplitudes of* 16 ± 0.1*,* 20 ± 0.2*,* 24 ± 0.1*, and* $28 \pm 0.1 kA/m$*, respectively. Normalized experimental data followed a linear trend approximately parallel to theoretical values with an R2-value of 0.99. The measured SLPs of the JHU particles are higher than BNF particles within the tested AMF amplitude range of 15kA/m to 45kA/m. We demonstrated that copper can be used to calibrate magneto-thermal calorimetric systems used for SLP measurements of magnetic nanoparticles for a field range of 15–28kA/m at* $160 \pm 5 kHz$*. We also note that the electrical conductivity, diameter of copper sample and accuracy, and response time of thermometry constrain calibration to lower amplitudes, highlighting the need for development of standard reference materials for such applications.*